

City of San Rafael
Climate Change Action Plan

April 2009

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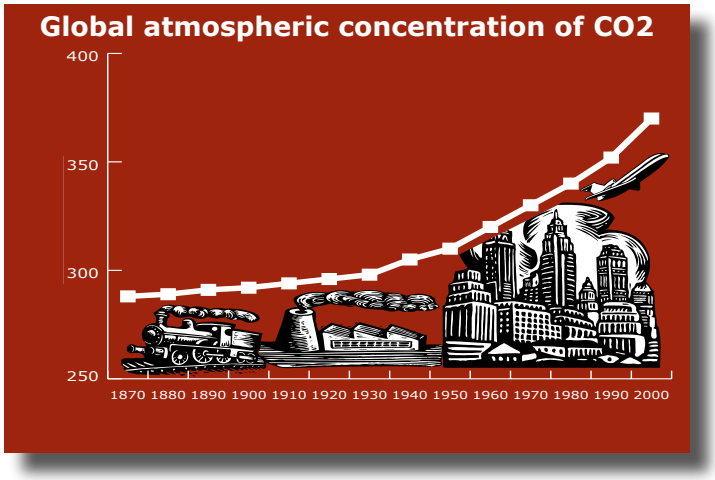
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Climate Change Action Plan

A Call to Action

Climate change - a global symptom of an unsustainable human lifestyle - is real. The level of carbon dioxide in the earth's atmosphere has increased by 31% since the dawn of the industrial age. As a result, icecaps are melting and weather patterns are changing. People are consuming at unsustainable rates the natural resources upon which economic prosperity and human development depend. Global oil supplies are declining, water supplies are not keeping up with demand, world fisheries are being depleted at alarming rates, and despite significant efforts to recycle, waste generation is increasing. If left unchecked, economist Sir Nicholas Stern predicts that the cost to adapt to climate change will require between 5 and 20% of the world's gross domestic product (GDP).

The good news, Stern concluded, is that concerted actions by government, business, communities and individuals can minimize the worst effects of climate change at a cost of 1% of world GDP, while



creating millions of new jobs in the process. Time is of the essence, though. In accepting the 2007 Nobel Prize on behalf of the U.N.'s Intergovernmental Panel on Climate Change, renowned engineer and economist Rajendra Pachauri stated, "If there's no action before 2012, that's too late. What we do in the next two to three years will determine our future. This is the defining moment."

What is Sustainability?

"...development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

- World Commission on the Environment and Development

"...this means living on the interest yielded by our natural systems rather than on the capital."

- John T. Lyle, "Regenerative Design for Sustainable Development"

San Rafael is stepping up to the challenge. Mayor Al Boro was one of the initial signers of the US Conference of Mayors Climate Projection Agreement in 2005, pledging the city to reducing greenhouse gas (GHG) emissions in accord with the Kyoto Protocols. To meet these goals, the City Council appointed a 16-member Green Ribbon Committee to lead a community process to prepare a plan to guide both the city organization and the entire community in responding to climate change.

This Plan is the result of that community effort.

Our Vision



In the year 2020…

San Rafael is flourishing.

Our community continues to serve as our foundation; we are engaged citizens with strong neighborhood connections.

We value our natural setting among grassy, wooded hills that are protected open space, with shoreline vistas and wetlands rich with wildlife and vegetation.

Our communities are diverse, complete with mixed-use development, neighborhood markets and gardens. We have walkable communities and are invigorated by our renewed contact with our neighbors.

Many of us work close to home, in jobs that are good for us and good for the environment. We have created and encouraged local services, technologies and solutions that support and enhance our thriving neighborhoods. We consume more local products and use our purchasing power more consciously. Our businesses and homes are powered by renewable energy that continues to build our local economy.

We have created a transportation system that offers efficient, clean and affordable mobility for all residents and workers in San Rafael.

We are healthy and so is our environment – our children play outside and our creeks and waterways are clearner. We have continued to support our spectacular open space and derive great joy from its presence.

We are prepared for changes in our climate and the bay.

We have learned how to create a green and healthy future.

How Was This Plan Created?

San Rafael utilizes the philosophy of "Community-based Governance," engaging our residents and stakeholders in community planning efforts. In May, 2008 the City Council solicited applications and appointed 14 community members to a "Green Ribbon Committee" to prepare this Plan, and another 13 volunteers to provide technical input as part of four topical "Green Teams." The larger community was invited to a "Vision Green" workshop in July, 2008 which resulted in our Vision statement and generated over 300 ideas on how the City and the community could reduce GHG emissions. The Green Teams utilized this input to propose over 200 potential programs which were subsequently analyzed by staff from the City and experts from other agencies. These were then prioritized by the Green Ribbon Committee and shared with the public at a workshop in January, 2009. The proposed Plan from the Green Ribbon Committee was presented to the Planning Commission and City Council in April, 2009 and adopted in May, 2009.



Climate Change Action Plan

Summary

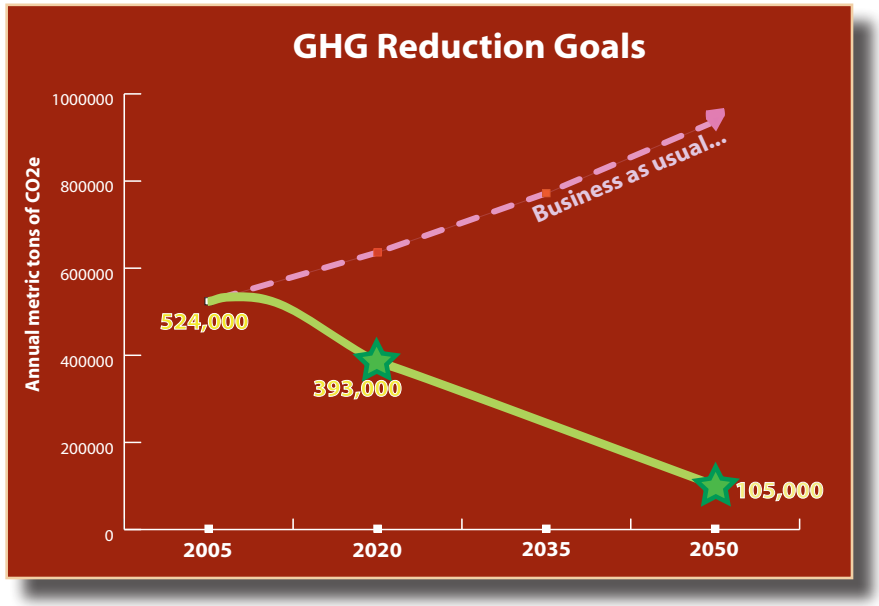
Our Goals for Reducing Greenhouse Gas Emissions

The City of San Rafael will have to comply with recent and anticipated state and federal regulations on reducing greenhouse gas (GHG) emissions, such as California's landmark AB32 and SB375 legislation. At present, local governments in California are being asked to reduce GHG emissions 15% from current levels by



2020, with an ultimate state-wide goal of 80% reductions by 2050, which scientists have determined to be the amount necessary to arrest the effects of global warming.

San Rafael's community-wide GHG emissions in 2005 amounted to 524,148 tons of CO_2e (equivalent carbon dioxide units, including nitrous oxides and methane). A 15% reduction from this level would actually constitute a 30% reduction by 2020, since the community's



GHG emissions are projected to continue to grow 21% over that time period if unchecked.

Implementation of the programs recommended in this Plan, together with others already underway, would meet the state's AB32 goal for local government actions by achieving a 15% reduction in San Rafael's GHG emissions. The Plan targets a total reduction of 25% by 2020, to be achieved as actions at other levels of government, technological improvements and local educational efforts continue to spur residents and businesses to reduce their carbon footprints. The City will have to periodically update the Plan to achieve both this 2020 goal and the ambitious 2050 goal.

A Sustainable Community

This Plan seeks to reduce GHG emissions within the larger framework of achieving a more sustainable society. A sustainable community is one which wisely utilizes and replenishes its resources on three levels: its environmental resources (land,

raw materials, ecology), its community resources (human well-being, social organizations) and its economy (financial resources, businesses and jobs). This Plan attempts to improve our community resources on all three levels by initiating actions that over time will enhance how we relate to our natural setting, live our lives and generate our livelihoods. The goal is to achieve a balance such that our use of resources will be sustainable over the long term.

The Plan is organized by how its recommendations affect the various facets of our community:

Our Lifestyles (LF):

- Compact, Transit-Oriented Development
- Non-Auto Mobility
- Energy Efficient Vehicles
- Waste Reduction

Our Buildings (BU):

- Resource and Energy Conservation
- Renewable Energy Production
- Water Conservation

Our Environment (EN):

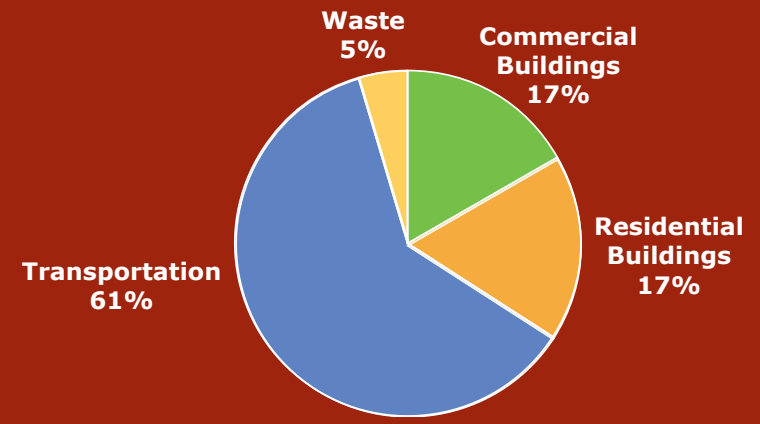
- Urban Forestry and Local Food Production
- Habitat Protection and Restoration
- Adaptation to Climate Change

Our Economy (EC):

- Green Businesses
- Social Equity

Where do our GHG emissions come from?

San Rafael's GHG emissions inventory was prepared by the International Council for Local Environmental Initiatives (ICLEI). The inventory identifies the community-level emissions in 2005. While some legislative targets for GHG reductions relate to the year 1990, accurate data for local energy use is not available for that time period. San Rafael's inventory includes all GHG emissions which occur within the City's boundaries plus emissions resulting from energy production from PG&E which occur outside the community. In the transportation sector, this includes emissions from all vehicles on Highway 101 within San Rafael as well as traffic on local streets. The inventory, which is available on the City's website (www.cityofsanrafael.org), also differentiates between GHG emissions from the community versus that generated by City operations (City facilities, vehicles and employee commutes). GHG emissions attributable to City operations equal 1% of the total community GHG emissions.



Our Lifestyles

The Problem, the Solutions, the Benefits:

Despite our environmental consciousness, per capita GHG emissions from Marinites are among the highest in the U.S. due to our affluence – we own more vehicles, live in larger homes and purchase more products.

Transportation accounts for 62% of GHG emissions in San Rafael – our largest source of emissions. This is a very difficult area to address because San Rafael has little control over traffic on our highways, fuel efficiency standards, gas taxes or technological breakthroughs. In 2000, almost two-thirds of San Rafael commuters drove alone to work, with an additional 12% carpooling, 12% using transit, 3% walking and 2% bicycling.

The best way for local governments to address emissions from transportation is to regulate how our cities are developed. Studies have shown that people who live near transit drive between 20 and 40% less. Other studies have found that low-density suburban development generates over twice as much GHG emissions per capita than a more urban development pattern. As urban centers, such as Downtown San Rafael, become more densely populated, transit, walking and biking become more attractive alternatives to auto use.

Auto Use by Development Type

		
	Low Density Subdivision	**Transit Village**
Units per acre	**3.2**	**10**
Annual auto miles/capita	**10,591**	**6,455**

We can also provide better infrastructure to make alternate modes of mobility more convenient, such as additional bicycle lanes, more bicycle parking, better sidewalks and commuter rail. Every 1% shift of mileage from automobiles to non-motorized modes reduces energy consumption and GHG emissions by 2-4% due to less congestion and vehicle idling.

Waste disposal accounts for less than 5% of GHG emissions in San Rafael. The number is low because “upstream” impacts (the manufacture and distribution of goods that occurs outside the boundaries of San Rafael) are not included. When upstream impacts are included, every ton of waste eliminated directly avoids one tons of GHG emissions.

Solid waste management uses a hierarchy of approaches:

> **Reduce** the amount of waste created through efficient use of resources, more durable products, less packaging and less overall purchasing.
>
> **Reuse** products and packaging as much as possible.
>
> **Recycle** discarded products and packaging, and turn organic materials into compost or energy production.

While the City and its waste contractor have achieved a state record 62% diversion rate through recycling, the remaining waste from San Rafael deposited in the landfill has increased by 20% over the past decade. In 2006 the Marin County Hazardous and Solid Waste Management Joint Powers Authority (JPA), with participation from all of the cities and the County, adopted a Zero Waste Goal by 2025, and have initiated a strategic planning process to achieve this goal. Another promising venture is a local pilot program to test anaerobic digestion of food waste from restaurants and grocery stores to produce electricity from biogases produced, and thereby eliminating the creation of methane from landfilling.

Debris from construction and demolition projects account for 22% of the waste stream in California, but can be reduced by at least half through recycling and reuse programs.

What the City Has Already Done:

San Rafael’s General Plan 2020 is based on Smart Growth principles: creating compact residential and commercial development near transit and services. In 2006 the Greenbelt Alliance ranked San Rafael ninth out of 101 Bay Area cities in promoting Smart Growth land use policies.

The City adopted a Pedestrian and Bicycle Master Plan in 2002 to retrofit our community with new bicycle lanes and sidewalk improvements. Since then, over 26 miles of new bicycle routes and sidewalk enhancements have resulted – a fourfold increase.

San Rafael was a consistent supporter of the SMART commuter rail, which was approved by the electorate in 2008 and will begin operations in 2014 with two stations in San Rafael.

The City has also implemented a preferred green purchasing program for fleet vehicles, adding several hybrid vehicles. The City has also converted all diesel trucks to use biodiesel fuel.

Recommended Programs:

Decrease miles travelled in single-occupant vehicles

LF1: Continue to encourage greater residential and commercial densities within walking distance of high frequency transit centers and corridors as called for in the General Plan. High frequency is defined as buses arriving at least every 15 minutes.

LF2: Consider land use and transportation alternatives (better bicycle and pedestrian access and increased transit feeder service) to best use the future Civic Center SMART station.

LF3: Identify neighborhood areas which do not have suitable pedestrian facilities, convenience retail services and transit stops within walking distance. Determine if sidewalk improvements, land use changes or transit stop locations can be modified for underserved areas.

LF4: Facilitate creation of a bike share program, particularly in the Downtown area.

LF5: Coordinate with Marin Transit and the Transportation Authority of Marin to pursue funding opportunities to increase transit service and improve convenience to encourage greater ridership.

LF6: Continue to implement sidewalk and street improvements for the Safe Routes to School program. Encourage the school districts, Marin Transit and the Transportation Authority of Marin to increase funding for school busing programs, promote carpooling and limit vehicle idling.

LF7: Provide transit and carpool incentives to City employees, including alternate work schedules and telecommuting opportunities.

Promote energy savings from transportation

LF8: Encourage ownership of plug-in electric vehicles, as they become available and in use, by providing charging stations in City garages and parking lots, consider requirements for charging stations in newly constructed private parking facilities, and participate in regional efforts to encourage widespread availability of charging stations.

LF9: Adopt a policy to limit City vehicle idling where practical. Evaluate equipping trucks with an auxiliary electrical system for illumination and warning signs.

LF10: Educate and encourage businesses and residents to limit vehicle idling.

Reduce material consumption and increase resource re-use

LF11: Adopt a Zero Waste Goal and develop a Zero Waste Strategic Plan for San Rafael.

LF12: Encourage the Marin County Hazardous and Solid Waste JPA to establish a landfill “tipping fee” to fund waste reduction efforts.

LF13: Encourage programs to educate and assist homeowners in composting, and the creation of facilities to convert organic waste (e.g., vegetative or food waste) to energy to significantly reduce or eliminate landfill disposal.

LF14: Work with the City’s waste franchisee to create additional incentives in the rate structure for waste reduction and recycling and expand the range of recycled products if resale markets exist.

LF15: Adopt a construction debris recycling and reuse ordinance.

LF16: Assist in the establishment of additional reuse facilities (resale shops, refilling stations, repair shops and resource recovery yards).

LF17: Investigate options for banning nonrecyclable single use items, such as plastic bags and polystyrene takeout food containers.

LF18: Modify the City’s purchasing practices and policies to become a model for other businesses and organizations.

Our Buildings

The Problem, the Solutions, the Benefits:

The construction and occupancy of buildings consume much of our natural resources. According to the U.S. Department of Energy, construction and occupancy of buildings account for 39% of total annual energy use, 68% of total electricity consumption and 12% of total water consumption. In San Rafael, buildings account for about one-third of our GHG emissions for lighting, heating, cooling and cooking, split almost evenly between our residential and commercial sectors. The two fundamental means for reducing emissions from electricity and natural gas are decreasing consumption through efficiency and switching from fossil fuels to renewable sources.

Shifting our energy sources from decreasing supplies of fossil fuels to renewable resources such as wind and solar has the greatest effect on GHG emissions. This objective will be pursued by San Rafael and other Marin agencies involved in the new Marin Energy Authority.

Increasing the efficiency of existing buildings is the most cost-effective approach for reducing GHG emissions. Programs that promote energy efficiency upgrades for home remodeling, such as increasing insulation and sealing heating ducts, have demonstrated energy savings of up to 20%.

New construction techniques and building materials, known collectively as "green building," have proven that we can significantly reduce the use of resources and creation of waste in our dwellings and commercial buildings. The average premium for adding green building features is less than 2% of construction costs, and can result in cost savings of 20% oaver the life of a structure. For example, an initial investment of $100,000 in a new commercial building costing $5 million would result in a savings of $1 million in today's dollars over the life of the building.

The largest single purpose use of electricity in Marin County is related to the pumping, treatment and disposal of water and wastewater. Water conservation not only minimizes the need to find new sources and expand infrastructure, but also saves energy to treat and convey water and wastewater. It has also been proven that employing water conservation techniques and using native plant materials is less expensive than securing and providing new water supplies.

Adding Energy Efficiency to Your Remodel

Measure	Added Cost	Savings	Payback
Insulate walls	$138	$132/yr	1 year
Seal air leaks	$200	$152/yr	1.3 years
Seal duct leaks	$160	$108/yr	1.5 years
Energy Star clothes washer	$300	$55/yr	5.5 years

What the City Has Already Done:

San Rafael was among the first cities in the Bay Area to adopt a mandatory Green Building Ordinance in 2007. The ordinance requires that all new dwelling units be Green Point Rated using standards developed by Build It Green, and that new commercial or civic buildings meet LEED (Leadership in Energy and Environmental Design) standards developed by the US Green Building Council. Green Point Rated homes use 53% less electricity and 34% less natural gas than comparably sized structures, and LEED commercial buildings are 18-30% more energy efficient.

The City also has converted all its traffic signals to LED lights for significant energy savings, and is in the process of converting its signature Downtown "twinkle" lights to LED.

Recommended Programs:

Increase the supply of renewable energy sources

BU1: Support efforts of Marin Energy Authority to increase the proportion of renewable power offered to residents and businesses and to provide financial and technical assistance for energy efficiency upgrades.

BU2: Consider creation of, or participation in, an assessment district bond financing program to fund installation of renewable energy systems and other efficiency upgrades.

BU3: Adopt zoning allowances for residential wind power generators and for location of solar collectors.

Reduce dependency on non-renewable resources

BU4: Apply green building requirements to residential, commercial and civic remodeling projects as well as new construction.

BU5: Develop a program to achieve energy savings in existing buildings, with a goal of decreasing energy use by 20% as of the year 2020.

BU6: Develop a program to achieve water conservation in existing buildings and landscaping, with a goal of reducing water use by 30% by the year 2020.

BU7: Complete the energy audit of major City buildings and facilities to identify opportunities for efficiency measures and renewable power generation opportunities and develop an implementation plan for upgrades.

Our Environment

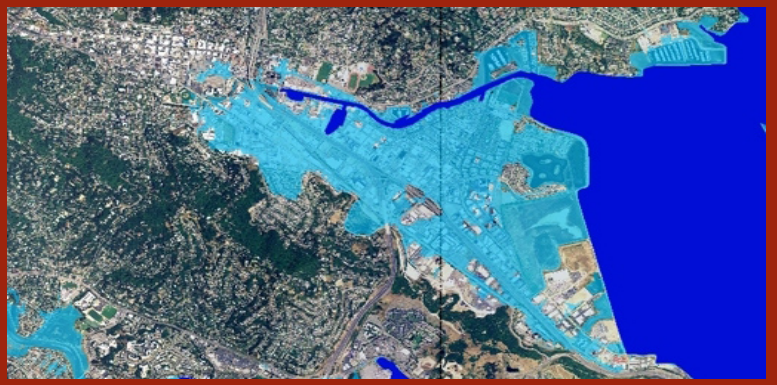
The Problem, the Solutions, the Benefits:

Our society has been taking resources from our natural environment without considering long term sustainability. Food production is increasingly dependent on petroleum for fertilization, processing and transportation to markets. Deforestation accounts for between 25 and 30% of global GHG emissions. Fortunately, Marin has been a leader in open space preservation and organic farming.

On a local level, we can improve this situation by encouraging more local food production and sales and by increasing the carbon sequestration in our urban forests. Forests, plants in wildlands and garden landscapes have the capacity to remove carbon dioxide from the atmosphere and store it as carbon in wood, leaves and roots. In addition to encouraging more plantings of street trees and private landscaping, the City can better restore and manage its parks and open space lands, which comprise 42% of the City's land area.

Our natural systems, as well as our built environment, will be affected by climate change in ways we are only beginning to understand. Concerns over rising sea levels are most obvious. The Intergovernmental Panel on Climate

Effects of a 3-Foot Sea Level Rise



Climate Change Action Plan

Change estimates that mean sea level will rise between one and three feet by the end of this century. A three-foot rise would inundate much of eastern and central San Rafael. Climate change is predicted to increase the risk of large wildfires in California by as much as 55% and to decrease the Sierra snowpack by 80% by the end of this century. Winter rainstorms are predicted to be more concentrated but more sporadic.

What the City Has Already Done:

San Rafael has among the highest proportions of dedicated public open space of any comparably sized city in the Bay Area. The City adopted stringent policies to preserve our wetlands in the late 1980's and to limit the impacts of hillside development in the 1990's.

Since 1981, San Rafael has been designated a Tree City for our tree planting and preservation efforts. The City Council recently appointed a Tree Advisory Committee to make recommendations for maintaining and improving street trees.

Recommended Programs:

Increase carbon sequestration through tree planting and maintenance

EN1: Inventory tree and vegetative cover to determine existing resources and carbon sequestration, and establish citywide goals and strategies to increase carbon sequestration.

EN2: Adopt ordinances to regulate the removal and replacement of significant trees and preclude sale of invasive non-native plants.

EN3: Update zoning regulations for parking lot landscaping to increase shading and reduce thermal gain.

EN4: Consider establishing a local carbon offset program to support tree planting and maintenance.

Increase local food production

EN5: Encourage the creation of home and community gardens, including possible use of surplus City properties for community gardens.

EN6: Continue to promote local farmers markets.

Monitor sea level rise and plan for shoreline defense

EN7: Develop a program of levee analysis, including inventorying heights, testing and maintaining public and private levees.

EN8: Install a sea level monitoring gauge to track changes over time.

Increase understanding and preparation for the effects of climate change

EN9: Participate in Marin County's regional vulnerability assessment, and prepare a local vulnerability assessment for San Rafael.

EN10: Continue to provide emergency planning and community awareness.

Our Economy

The Problem, the Solutions, the Benefits:

Addressing climate change will not be successful unless proposed solutions are economically viable and the business community is engaged. These recommended initiatives offer opportunities for both new business and job creation. Long-term economic prosperity will also occur through savings from reduced energy expenses and avoidance of climate change mitigation costs..

Sustainability also means having a local workforce that lives locally. This includes developing higher wage jobs so workers are able to afford high local housing costs and creating affordable housing opportunities. Such opportunities benefit GHG reduction efforts by decreasing emissions from commuting.

What the City Has Already Done:

To promote the ability of employees to live within the community, the City established an affordable housing program in the 1980's that requires the provision of lower-cost units in new housing developments. More recently, financial contributions towards affordable housing are required from commercial development. The City's Redevelopment Agency also uses its resources to increase affordable housing opportunities. At present, there are 1,216 deed-restricted affordable units in the City's program.

The City has an active Economic Development Department to assist in business recruitment and retention.

Recommended Programs:

Support environmentally beneficial businesses and job creation

EC1: Continue to promote new green business opportunities.

EC2: Support and encourage green businesses in conjunction with Marin County's Green Business Program.

Enhance social equity among all segments of the community

EC3: Continue to expand the supply of affordable housing, which reduces commute times and congestion..

EC4: Support the creation of environmentally beneficial jobs, particularly for lower income residents.

Community Outreach and Empowerment

The Problem, the Solutions, the Benefits:

Addressing climate change will require innovation, commitment and collaboration among all members of the community. It will necessitate, in many ways, learning new ways of conducting our daily lives. We will need to investigate best practices, share information, monitor our progress and celebrate successes.

What the City Has Already Done:

As the largest city in Marin, San Rafael provides leadership through our involvement with other agencies. One example is the recently formed Marin Climate and Energy Partnership which seeks to assess common problems and develop common solutions among all the cities, towns and county government in Marin. We also jointly employ a lobbyist to advocate for local issues in Sacramento.

The City also maintains close relationships with community organizations, including homeowners groups and business and non-profit associations.

Recommended Programs:

Increase community education and commitment towards sustainability efforts

CO1: Increase City employees' awareness of climate protection issues, and develop internal committees (such as a green purchasing initiative or energy efficiency) to implement plans.

CO2: Use the City's website and City publications and work with community organizations to promote sustainability efforts to both residents and businesses.

CO3: Partner with other agencies and organizations to hold an annual "Green Festival" to promote sustainability efforts.

Encourage other levels of government to work towards sustainability

CO4: Advocate for state and federal legislation that advance GHG reductions and other sustainability efforts.

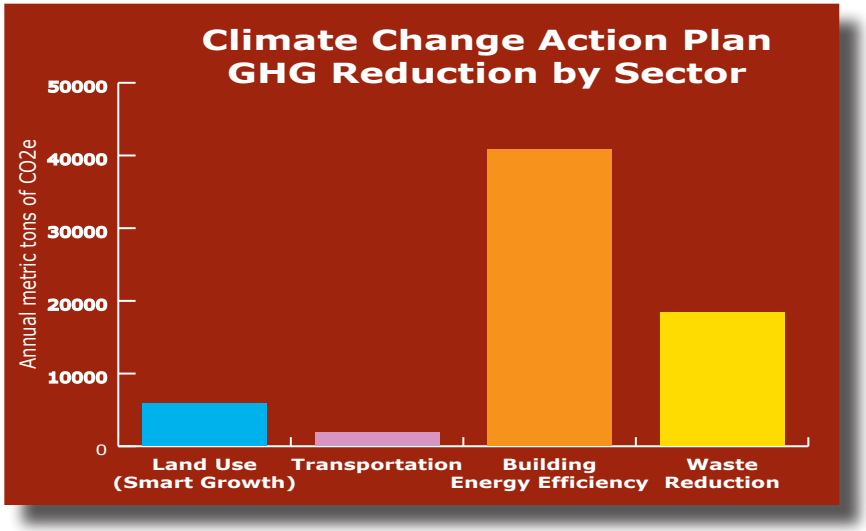
CO5: Continue to provide a leadership role with other local governmental agencies to share best practices and successes.

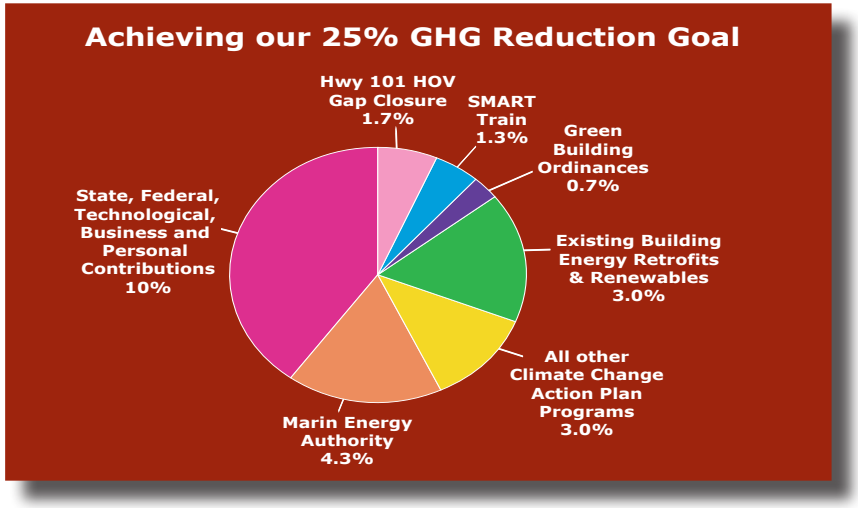
Implementation

The true test of our commitment and success towards addressing climate change will be in implementing this Plan. While great community effort went into preparation of the Plan, implementing it will require a significantly greater level of involvement. Given the number of new programs proposed, City funding will be necessary to devote new staff resources to sustainability efforts, which will be difficult in a down economy and given other demands for City services.

To evaluate the success of our efforts over time, an Implementation Matrix has been developed to clarify which City departments and community organizations will be responsible for implementing each of the proposed programs listed in this document, the anticipated time frame and priority for implementation, the GHG emission reductions anticipated, and indicators that will allow us to monitor progress in achieving our objectives.

The following two charts illustrate how we expect to meet our reduction goal. The first chart shows the GHG reductions anticipated in each sector from the programs outlined in this Plan. The second diagram indicates contributions of the programs outlined in this Plan towards our 25% reduction goal, including reduction from other efforts which are funded or underway such as initiation of the SMART commuter rail, completion of the Highway 101 HOV land widening and the newly formed Marin Energy Authority.





Recommended Programs:

Monitor success in achieving Plan objectives and update periodically

IM1: Evaluate future development applications and the City's Capital Improvement Program against compliance with the Climate Change Action Plan.

IM2: Prepare an annual report to the Planning Commission and City Council assessing the implementation of the Plan.

IM3: Hire a Sustainability Coordinator to advance efforts to implement the Climate Change Action Plan.

IM4: Appoint a Sustainability Commission to advance efforts to implement the Climate Change Action Plan.

Top 5 GHG Reducers

(Among Climate Change Action Plan Programs)

1. Greening our power supply (Program BU-1)
2. Retrofitting existing buildings for energy efficiency and renewable energy (Program BU-5)
3. Providing attractive bond financing for building retrofits and renewable energy installtions (Program BU-3)
4. Moving towards a zero waste goal and eliminating organic materials from the landfill (Programs LF-11 & 13)
5. Adding new housing near transit (Program LF-1)

What more can be done at regional, state, federal, corporate and global levels?

The scale of global climate change requires integrated action at all levels of government and society. Systemic changes can greatly expand the range of choices available to people as they seek to act responsibly. Local government and individual residents and businesses need to demand such changes, both to enable and empower their own actions and to see those actions replicated at larger scales.

Green the grid. Freeing the electrical grid of fossil fuels and integrating power delivery with 'smart' technologies provides the core infrastructure for climate-reponsible clean energy.

Re-tool and plug-in the automobile industry. As plug-in electric vehicles become available, their inherent energy efficiency is amplified by a greening grid. Alternative fuels and greater fuel efficiency, coupled with simply driving less, can help lower emissions during this transition.

Invest in transit and alternative transportation. Traditional transit, safe routes for bicycles and walkable communities all need sustained funding to underwrite a sustainable future.

Renovate communities with energy efficiency and renewables. Continue incentives for basic building improvements that reduce demand and increase the proportion of supply from renewable sources.

Revitalize the countryside with sun-based agriculture and sequestration forestry. Adjust subsidies to wean farming from oil dependency and to manage forests and other lands for long-term carbon content.

Stimulate green ingenuity and manufacturing. Develop incentives to tap the entrepreneurial spirit.

Educate and train a green workforce. Empower people to move into the green-collar jobs of the future.

Regulate carbon emissions and markets. Establish a fair and coordinated framework for carbon trading, sparking market-driven efficiency and innovation.

Support science and act on it. Fund basic research; monitor environmental change; base policies on science.

Launch a 10-year 'Mission for Planet Earth'. Set a clear vision of global climate and energy responsibility, at the scale needed to both address the problem and inspire solutions. Provide national and global leadership based on that vision.

What more can be done by individual residents and businesses?

To achieve the GHG reductions scientists say are necessary to curb global climate change - 25% by 2020 and 80% by 2050 - local governmental efforts must be amplified by individual actions. In fact, individuals can show that climate change can be solved. *The first five of these actions would reduce a person's contribution to San Rafael's carbon footprint by the full 80% necessary to arrest climate change.*

Invest in energy savings. Turn off lights and 'vampire' electronics; use compact flourescents; weatherize your house and buy Energy-Star appliances.

Rethink your transportation habits. Walk and bike more; drive and idle less; consolidate trips; car pool and use public transit.

Go solar. Capitalize on state and federal incentives to generate you own renewable energy. Combined with electrical appliances, this can eliminate much of your portion of the carbon footprint attributable to buildings (up to 17%).

Drive electric. Electric vehicles now becoming available enable dramatic cuts to the largest local source of carbon emissions, the 61% from cars. Plug-in to your home solar or other renewable source to eliminate your portion of this huge impact.

Achieve zero waste. Reduce, reuse, recycle, compost. By not sending waste to the landfill, you eliminate your part of the 5% of the carbon footprint attributable to waste disposal. Composting food waste returns carbon to your garden soil.

Grow and buy local food. The production and transport of food accounts for 25% of the global carbon footprint. Growing a home food garden and buying food from local organic farmers using minimal equipment reduces this impact.

Conserve water. Pumping water is the largest use of electricity in Marin, so reducing water use reduces carbon emissions. Take advantage of water district rebates and audits to install low-flow showerheads and toilets, landscape with drought-tolerant plants and take out ornamental lawns.

Plant trees. Trees are a natural carbon-sequestration technology, sponging carbon from the atmosphere. They can also provide windbreaks and shade, helping reduce home heating and cooling energy use and heat gain from asphalt.

Curb air travel and buy carbon offsets when you travel. Air travel causes over 3% of the global carbon footprint and can be much larger for individuals Consider alternative travel modes or teleconferencing, and offset travel with contributions to non-profit carbon reduction programs.

Think zero carbon. Carbon is thoroughly embedded in our economy, both in materials like plastics and in the energy expended to extract, produce, package and deliver what we use. Before purchasing or doing anything, pause to consider its full carbon cost to the planet - and what you might do differently to reduce that cost. Individual decisions can drive market transportation.

Climate Change Action Plan Participants

Green Ribbon Committee:
Kate Colin, Co-Chair, Planning Commissioner
Jennifer Islas, Co-Chair
Pauline Basaran
Christienne de Tournay Birkhahn
Joe Bunker
Damon Connolly, City Council member
Paul Ferreri
Damien Hansen
Kay Karchevski
Klif Knoles
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